NASA SBIR/STTR Technologies
Terahertz Quantum Cascade Laser-Based Sensors for Hypersonic Flows

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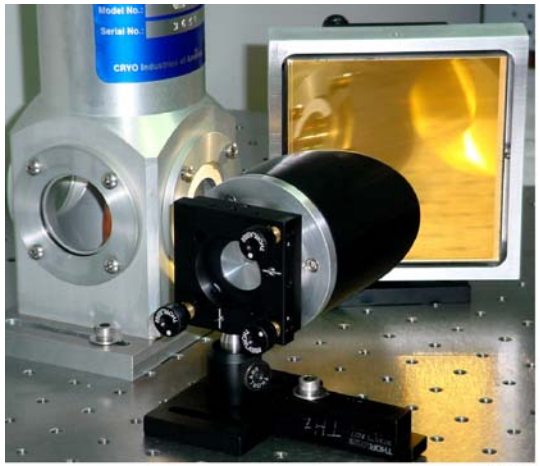
Identification and Significance of Innovation

- New compact and tunable terahertz (THz) laser source:
  - *External Cavity THz Quantum Cascade Laser*
- Enables direct absorption spectroscopy of atomic oxygen
- Characterize state of hypersonic flow
  - Improves quality of flow facility test results
    - Increases useful mission payloads
  - Provides previously unavailable capability



Technical Objectives and Work Plan

- Determine optimal operating regime
- Improve operating characters of QCL devices
- Build oxygen atom sensor
- Test and calibrate sensor with:
  - Water vapor
  - Atomic oxygen
- Deliver sensor to NASA Ames
  - Support training, installation, and testing

NASA Applications

- NASA Ames Aerodynamic Heating Facilty (AHF)
  - Contact Dr. George Raiche (650-604-1983)
- NASA Langley General Applied Science Laboratory (GASL)

Non-NASA Applications

- aerospace test facilities (atomic oxygen sensing)
- defense and homeland security (concealed explosives detection)
- industrial process monitoring (trace moisture)

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